

PROPOSAL TO NOMINATE AN EHRP ITEM OF INTEREST

Chalker Parade Railway Overbridge. Hill Top, NSW



Chalker Parade Bridge NJ Simons 26 June 1975

Item Name:	Chalker Parade road bridge over railway alignment.
Other/Former Names:	Hill Top bridge.
Locality:	Hill Top, NSW.
Address:	Chalker Parade between West Parade and Wilson Drive
Co-ordinates	34.35657° South, 150.49504° East

Nominated by:	Bill Phippen	
Contact Ph. & Email:	0412 379 236	billhippen@telstra.com
EHA Branch:	Engineering Heritage Sydney	
Current Owner:	Transport Asset Holding Entity, NSW.	
Original Owner:	NSW Railways	
Current use:	Overbridge, road bridge over rail	
Former use:	Overbridge, road bridge over rail	

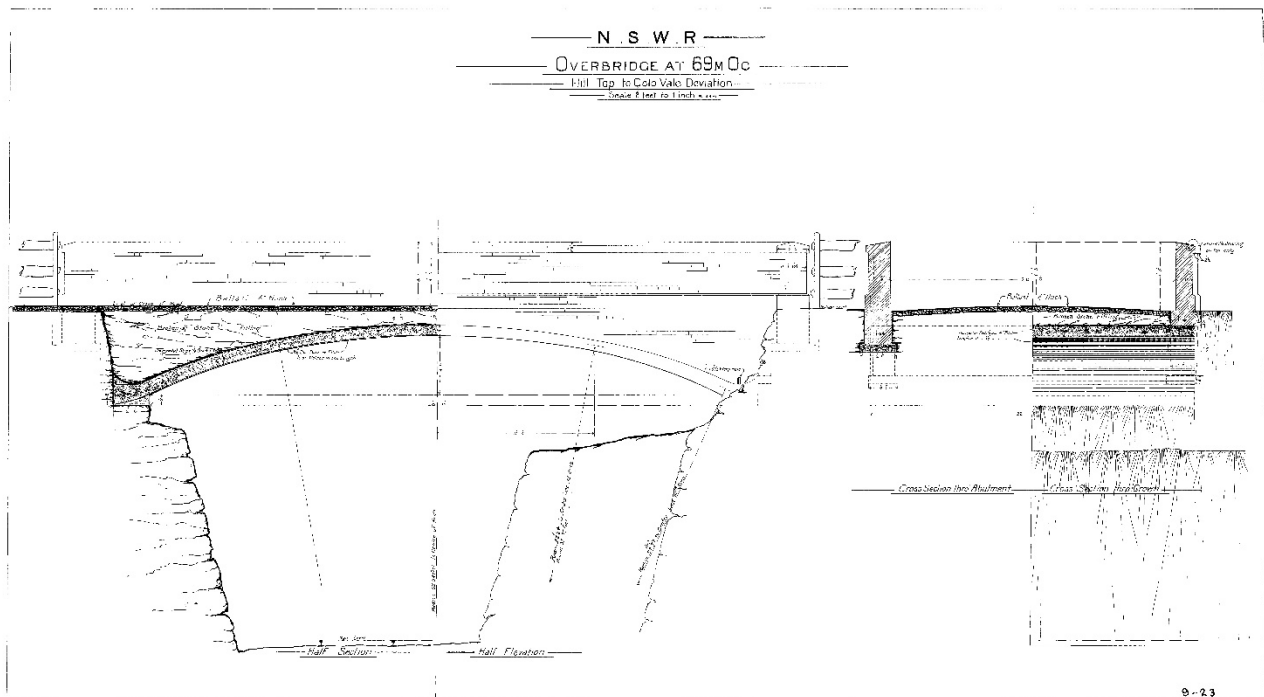
Proposed use:	Overbridge, road bridge over rail		
Item Condition:	Excellent, trafficable without any signposted limit.		
Designer:	NSW Railways		
Builder:	NSW Railways		
Started:	1897	Completed:	1898
History: (100 to 600 words)	<p>The original (1867) railway from Sydney to all places south and ultimately Victoria climbed the Bargo Ramp into the Southern Highlands along the ridge between the Bargo and Nattai Rivers. Although Hill Top, as the name suggests, was the summit of a significant and steep climb, the railway continued on a more or less direct route, descending to cross the valley of Ropesend Creek then rising again to reach Colo Vale.</p> <p>Traffic grew to the extent that, by 1897, improvements to the line were required and a deviation, heading the catchment of the creek, between Hill Top and Colo Vale replaced the original line, leaving Hill Top through a deep rock cutting. To maintain access to the town from the main road which followed the railway for much of its route, now called Wilson Drive, a road bridge was built over the cutting, carrying Chalker Parade and/or West Parade.</p> <p>The 1867 railway was of single track, as was the deviation, though the intention was apparently to later upgrade to double track, and to this end a minor underbridge immediately south of the town was built with wide brick abutments and the Chalker Parade bridge long enough to span the future two tracks, though the rock cutting has never been fully excavated beyond a single track.</p> <p>The new railway alignment was open before the bridge was completed so the falsework was made with a clear space for the trains to pass.</p> <p>The structure is a very shallow concrete arch (1.2m rise in 12m span) and is a thin (200mm) slab of near uniform thickness, only slightly deeper at the abutments. As such the line of action of thrust in the arch would not remain within the section during all loading conditions so iron or steel bars were provided at each face of the arch slab, with transverse bars also provided. These bars were relatively small at 10mm and 6mm.</p> <p>This was the first use of this Monier technique of reinforcing concrete by an array of metal bars as a road bridge in New South Wales. The sewer bridges at Whites Creek and Johnstons Creek in Sydney had been built only the year before and while these may have demonstrated the technique, their load was uniform and more or less constant. Chalker Parade, with the possibility of a heavy rolling wagon or traction engine crossing, was a more challenging proposition.</p> <p>The design and the construction are apparently sound. Superficial inspection would suggest that the bridge is in excellent condition and there is no posted weight limit.</p> <p>The 1897 intention to retain the route as the Main Southern Line and to duplicate it was not maintained. A total deviation from Picton to Mittagong, following a ridge on the opposite side of the Bargo River and with several tunnels, deep cuttings and meandering loops was opened in 1919. It does include several concrete arch overbridges, but they are not as shallow, and some doubt exists as to whether they are steel reinforced at all. The older line, re-named the Loop Line, was retained for local traffic and as an emergency bypass until 1978, when it was closed and functionally abandoned past Buxton, nearer to Sydney.</p>		

	<p>The Rail Transport Museum (now Transport Heritage NSW) was established at Thirlmere in 1976 and the Loop Line used for tourist shuttle services, but only as far as Buxton. Currently work is underway to rebuild the track between Buxton and Colo Vale and it is thus intended that museum trains will travel under the Chalker Parade bridge.</p> <p>Close to this overbridge are other items of engineering interest. The old railway route from Hill Top to Colo Vale was reworked as the through road for motor traffic and is noticeably unusual in that it follows a constant grade, cutting through higher ridges with large fills across gullies. North of Hill Top, closer to Sydney, on the climb from Balmoral the route cuts through Big Hill in a remarkably deep cutting which is crossed at its highest point by the Wilson Drive bridge. It is widely stated that this is the deepest cutting on the NSW railways and while this is technically not correct, the cutting is very narrow and quite spectacular, especially for 1866.</p>
Description: (100 to 600 words):	<p>The bridge is a concrete arch of shallow rise of 4 feet (1.2m) reinforced longitudinally near both faces with $\frac{3}{8}$" (10mm) plain bars at 4" (100mm) pitch, and with transverse bars of $\frac{1}{4}$" (6mm) diameter also at 4" (100mm) centres. The upper reinforcement does not extend to the crown of the arch. The arch ring is 8" (200mm) thick at the crown, slightly increased towards the abutments. The clear width of the superimposed road is 20 feet (6.1m). It has a nominal span of 40 feet (12.2m). The arch is surmounted with brick spandrel walls and parapets retaining broken stone filling.</p> <p>The arch spans a deep cutting with the arch bearing against strong undisturbed rock.</p>
Engineering Significance: (Refer Section 2.4 in 'An Engineer's Guide to the Conservation of Australia's Engineering Heritage')	<p>The use of reinforced concrete in Australia began just before the end of the nineteenth century. The Chalker Parade bridge was one of the earliest uses and the first use as a road bridge in New South Wales</p>
Webpage Summary: (200 to 300 words)	<p>This bridge is significant in that it is the first reinforced concrete bridge to carry road or rail traffic in New South Wales and one of the earliest in Australia, if not the first. It is predated by a year by the sewerage aqueducts built over Whites Creek and Johnstons Creek in Sydney, but the more onerous loading condition at Hill Top, of a heavy rolling load such as a traction engine or wagon was an extra challenge for the designers – the engineers of the NSW Railways.</p> <p>The arch has a span of 40 feet (12.2m) and a rise of only 4 feet (1.2m). With such a small rise there is a risk that under some loads unacceptable tension could occur in the concrete of the arch ring leading to damage or collapse. This is countered by casting into the concrete, near both faces of the curved slab, small (6 and 10 mm) steel or iron rods, much as would be done in modern concrete work. The slab of the arch is very thin at 8 inches (200mm) and is only slightly thicker at the abutments.</p> <p>The bridge is reinforced using the Monier technique pioneered in the 1860s by Joseph Monier, an illiterate French gardener, to make flower pots. There were other techniques for reinforcing concrete being tried at the time of this bridge's construction but the Monier method of using a mesh of relatively small bars became the dominant method in the twentieth century.</p> <p>The bridge was designed to span two tracks as at the time it was planned that the railway line below would remain as the Main South Line, but once the interstate route was diverted through Bargo in 1919 the cutting below the bridge was never widened.</p>

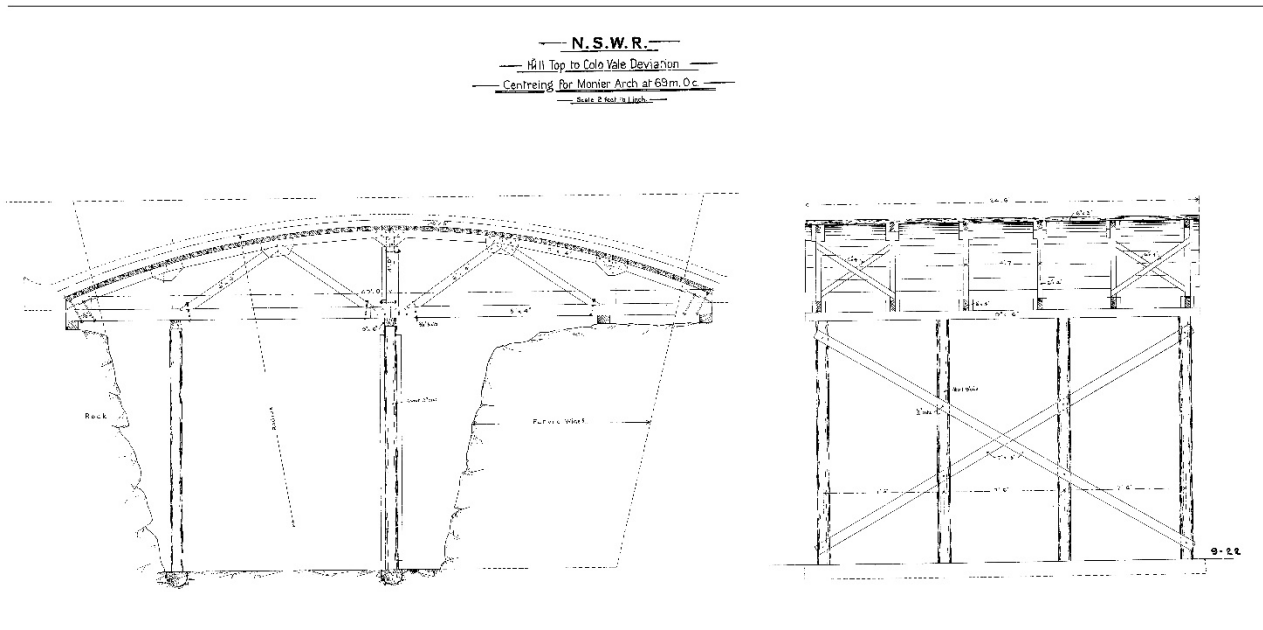
Engineering Theme	Transport – Rail, River and Road Engineering and Technology
Heritage Listing: (State and/or Local Authority)	The bridge is not listed on any Heritage Register.



Chalker Parade Bridge Jack Smith 30 January 2016



Original NSW Rail Plans. 6 April 1897.



Centring for arch. NSW. 1897.